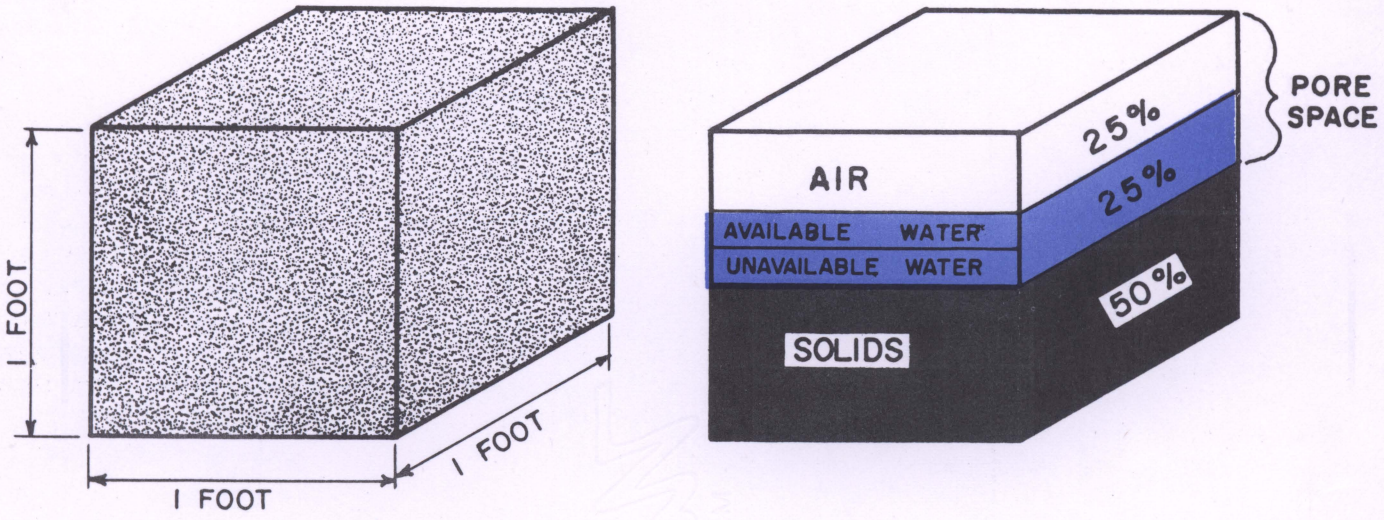
IRRIGATION FACTS

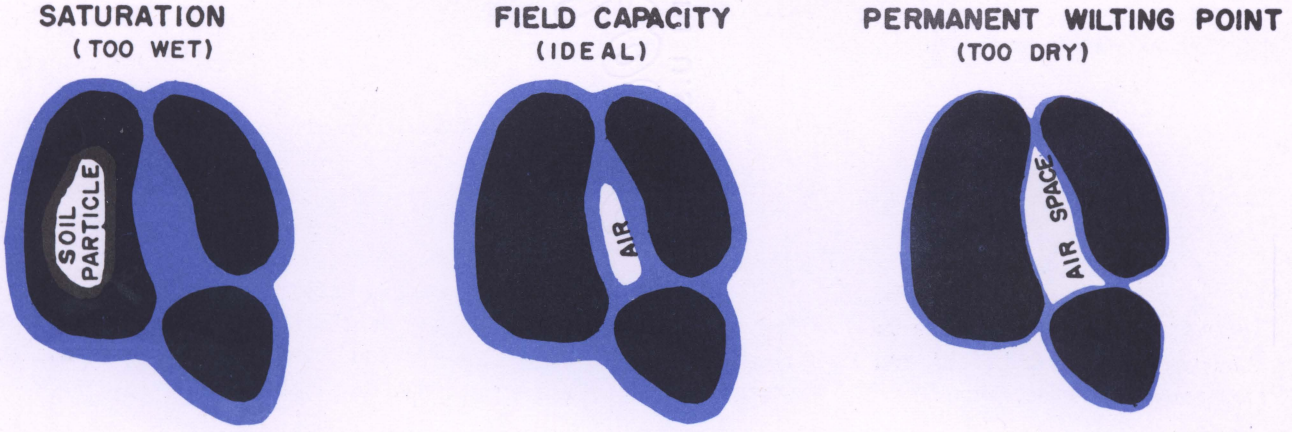
R. V. THURMOND, EXTENSION
AGRICULTURAL ENGINEER-IRRIGATION
Texas A. & M. College System

Soil Moisture Storage

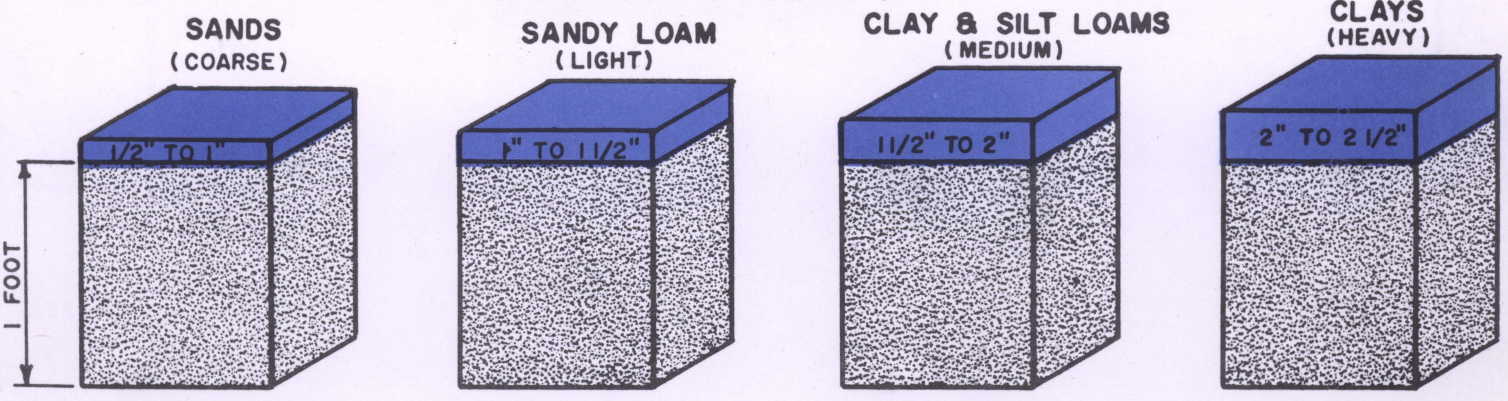
IRRIGATED SOIL



SOIL MOISTURE CONDITIONS



AVAILABLE MOISTURE STORAGE CAPACITY FOR VARIOUS TEXTURED SOILS (PER FOOT OF DEPTH)



Soil Moisture Storage

SOIL MOISTURE TERMS

Available Moisture - The soil moisture available for normal plant use. It is the moisture which occurs in a soil between field capacity and wilting point.

Saturation - A condition in which all pore spaces of a soil are filled with water. A soil remains saturated only if water is not allowed to drain from it.

Field Capacity - The amount of water a soil will hold against drainage by gravity. In well-drained soils this moisture content will be reached 1 to 2 days after irrigation.

Permanent Wilting Point - The soil moisture content at which plants permanently wilt.

Intake Rate - The rate at which water enters the soil, expressed in inches per hour.

THE SOIL RESERVOIR

The soil serves as a storage reservoir for moisture. It is partly solid material and partly space. On a volume basis, the soil is about half solid material and half pore space, the pore space being occupied by water and air. (See illustration.) Water is held in soils as thin films around the soil particles. (See illustration.) Approximately half of the pore space on a recently irrigated soil which is well drained is occupied by water. Only half of this water is available for use by plants. Thus about one-eighth of the equivalent soil volume contains available water for plants. Because there are more particles of smaller size in clay soils than sands, the fraction is larger for clays and smaller for sands. The chart on the reverse side gives the approximate available water storage per foot of depth for various textured soils.

HOW SOILS ARE WETTED

Water applied to soils moves downward by gravity through the pore spaces in the soil. Some of the water clings as a film to the soil particles while the excess moves downward to satisfy the needs of more particles below. After an irrigation, the soil throughout the wetted portion is of uniform moisture content. Hence a light application of water simply wets a shallower depth of soil than a heavy one. Soils cannot be partially wetted. They are completely wetted or not at all.

Cooperative Extension Work in Agriculture and Home Economics, The Texas A. & M. College System and the United States Department of Agriculture cooperating. Distributed in furtherance of the Acts of Congress of May 8, 1914, as amended, and June 30, 1914.